Arthroscopic Resection of Wrist Ganglion Arising from the Lunotriquetral Joint

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Abstract

The dorsal wrist ganglion is the most common wrist mass, and previous studies have shown that it arises from the scapholunate interval in the vast majority of cases. Treatment has traditionally been open excision, and more recently arthroscopic resection has been established as an effective and less invasive treatment method. However, application of this technique to ganglia in atypical locations has not been reported, where open excision is the usual practice. This report describes two cases of atypical dorsal wrist ganglia that arose from the lunotriquetral (LT) joint, demonstrated by arthroscopic visualization and wrist arthrogram in one of them. Arthroscopic resection was performed, and the application of this technique to a dorsal wrist ganglion with an atypical origin and location is described.

Keywords

- wrist ganglion
- lunotriquetral joint
- wrist arthroscopy
- arthroscopic ganglion resection
- atypical dorsal wrist ganglion
- wrist arthrogram

The ganglion is the most common soft tissue tumor of the hand and wrist, and the dorsal wrist ganglion is more common, comprising 54–68% of all ganglia.[1] In his series of 500 dorsal wrist ganglia, Angelides et al[2] found that apart from carpal-metacarpal bossing, they exclusively arose from the scapholunate ligament. This has also been confirmed by others. In the series of dorsal wrist ganglia treated by arthroscopic resection by Osterman, Geissler, and Luchetti,[3–5] all of these cysts originated from the scapholunate junction. There were also reports, although less common, of dorsal wrist ganglia arising from other sites. In a review of 62 dorsal ganglia, Clay et al[6] found that 76% arose from the scapholunate ligament, and others arose from various locations such as the capsule, the capitate/hamate junction, and the radioscaphoid joint. Others reported ganglia from the triangular fibrocartilage complex[7] and the accessory ossicle of the ulnar styloid.[8] There was one report that found three out of 122 dorsal ganglia (2.5%) being "in the region of the lunotriquetral articulation," diagnosed by magnetic resonance imaging (MRI).[9] However, it is not known whether these truly originated from the lunotriquetral (LT) junction, as there was no validation with intraoperative findings.

Dorsal ganglia of the wrist have been successfully treated by arthroscopic means, and recurrence rates similar or superior to those of open surgery have been demonstrated. In the series of 50 cases by Guiboux,[10] there was no recurrence. Other case series report recurrence rates of 4–6%.[5,11] In the series of 21 cases by Ho,[12] there was a recurrence rate of 26%, although the recurrences were smaller than the original lesions and no reoperations were necessary. In a randomized prospective trial comparing arthroscopic with open techniques,[13] recurrence rates were similar in both treatment arms. Arthroscopic techniques were described in the context of the "typical" dorsal ganglion arising from the scapholunate junction. It has been described that arthroscopic surgery is ideally suited to "a single-lobe ganglion located between the third and fourth dorsal compartments."[4] For dorsal ganglia arising from atypical sites, such as those on the ulnar side, arthroscopic treatment has not been widely applied, and they have been traditionally dealt with by open excision.

We describe two cases of ulnodorsal wrist ganglia arising from the LT joint that were treated successfully by arthroscopic means in our center.

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Fig. 1 Dorsal wrist mass in case 1.

Case Reports

Case 1

A 64-year-old right-handed kitchen worker presented in our clinic with a swelling and pain over the dorsum of her right wrist for half a year. There was no history of trauma. The swelling was 1 × 3 cm in size and was located in the dorsoulnar aspect (►**Fig. 1**). Aspiration was performed, but the mass soon recurred. Ultrasonography detected a unilocular ganglion with a stalk extending below the dorsal LT ligament to the LT articulation. The patient then underwent surgery for pain relief and cosmesis. An intraoperative wrist arthrogram showed contrast going through the stalk of the ganglion opposite the LT junction mainly from the midcarpal joint (►**Figs. 2** and **3**). Portal site local anesthesia was administered. One mL 1% lignocaine with adrenaline (1:200 000)

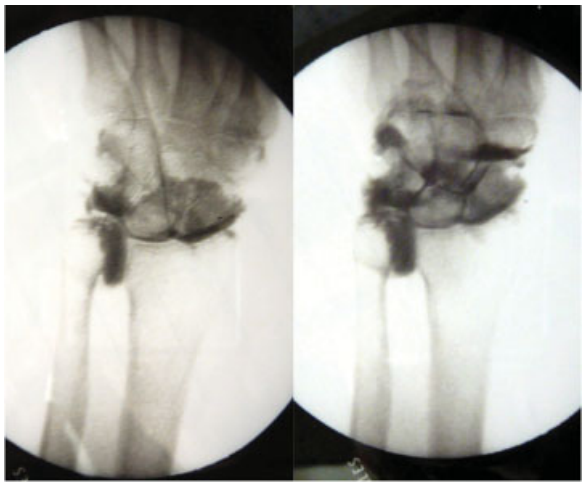

Fig. 2 Wrist arthrogram of case 1, showing contrast pooling at the lunotriquetral junction, with a concomitant TFCC tear.

was injected to each portal site from the skin down to the capsule. Arthroscopy was performed using the 3–4 portal for the arthroscope and the 6R portal for the shaver (►**Fig. 4**). It revealed a central tear of the triangular fibrocartilage complex (TFCC) and synovitis of the dorsal capsule opposite the LT junction. A synovectomy and resection of the capsulo-ligamentous junction with digital pressure against the stalk was performed until there was complete drainage of gelatinous fluid into the radiocarpal joint (►**Fig. 4**). The cutting edge of the shaver was directed outward toward the capsule, away from the LT ligament, to prevent ligament injury. A limited resection of a cuff of the capsule with the shaver was performed, creating a capsular defect of 5–10 mm (►**Fig. 5**). Care was taken not to injure the articular surface. The integrity of the extensor digiti minimi tendon was ascertained throughout the procedure by asking the patient to extend her little finger voluntarily. The wounds were opposed with adhesive strips, and no suturing was required. After the operation, no immobilization was required, and active and gentle passive mobilization of the wrist was

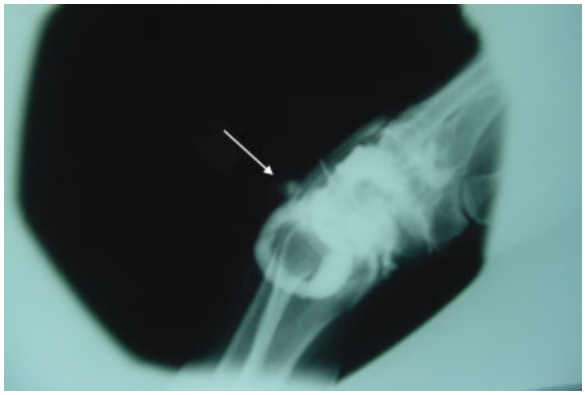

Fig. 3 Wrist arthrogram of case 1, lateral view. The arrow points to the ganglion stalk.

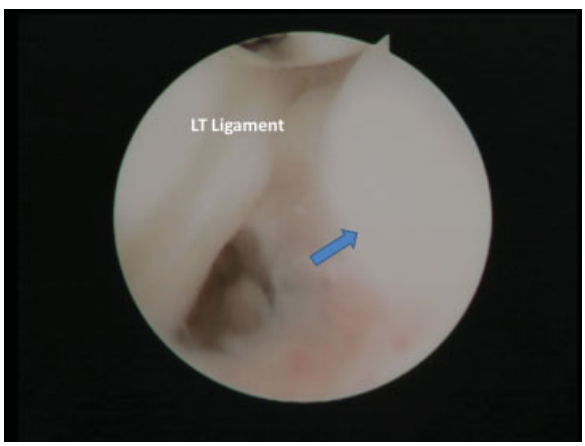

Fig. 4 Arthroscopic photograph showing the lunotriquetral ligament and a capsular bulge when external pressure was applied.

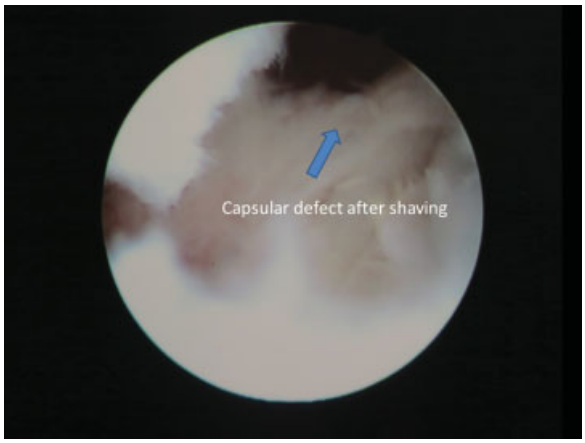

Fig. 5 Arthroscopic photograph showing the capsular defect after shaving.

encouraged. She was discharged later on the same day as the surgery. On follow-up, she had regained full function of her wrist at 1 month. She was seen again 9 years after the operation in a home visit. There was no recurrence, a cosmetically satisfying outcome with inconspicuous scars, no pain, and a return to the preoperative range of motion of the wrist of 60° flexion and extension (►**Fig. 6**).

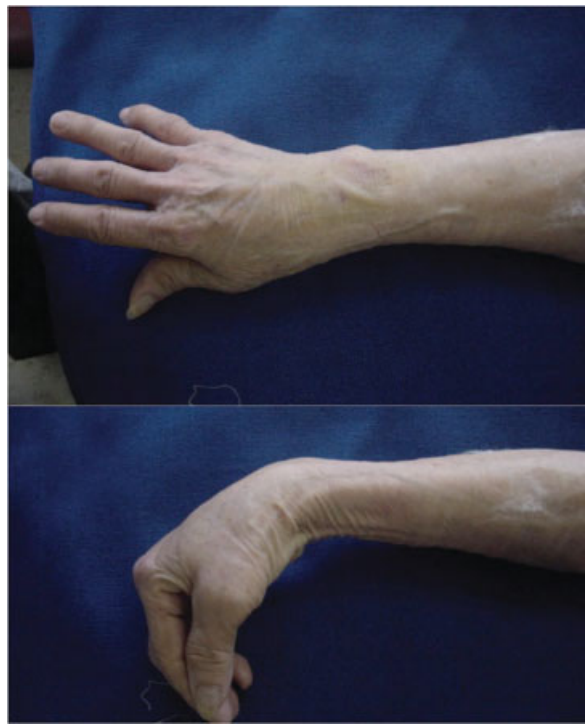

Fig. 6 Postoperative photograph showing satisfactory cosmesis and flexion range.

Case 2

A 19-year-old, right-handed male student presented to our clinic with bilateral wrist masses. On the left wrist was a dorsal ganglion, which recurred 2 years after aspiration and was located in the usual site overlying the scapholunate interval. On the right wrist was a 2-cm cystic mass at the ulnar-dorsal side (►**Fig. 7**). There was no history of trauma, and the masses did not give rise to pain. Surgery was performed for cosmesis. Port-site local anesthesia was administered. An arthroscopic ganglion resection was performed bilaterally at the same setting. Arthroscopy was performed using the 3–4 portal for viewing and the 6R portal for instrumentation. The ganglion was located over the distal border of the LT junction, with the stalk arising from the LT joint (►**Fig. 8**). This was seen by direct vision and arthrogram was not performed. Complete evacuation of the ganglion was done along with a 5–10-mm cuff of capsule (►**Fig. 9**). Again, the integrity of the extensor digiti minimi tendon was checked intraoperatively. Immediate motion was allowed. At 4 weeks postoperative, the patient had regained full wrist motion. At 3 years, there was no recurrence of the LT ganglion, with a full range of motion (►**Fig. 10**). There was no pain, and the patient was satisfied with the cosmesis. However, the scapholunate ganglion recurred, and the patient underwent a second arthroscopic surgery for his left wrist.

Fig. 7 Case 2, photograph of the wrist mass before operation.

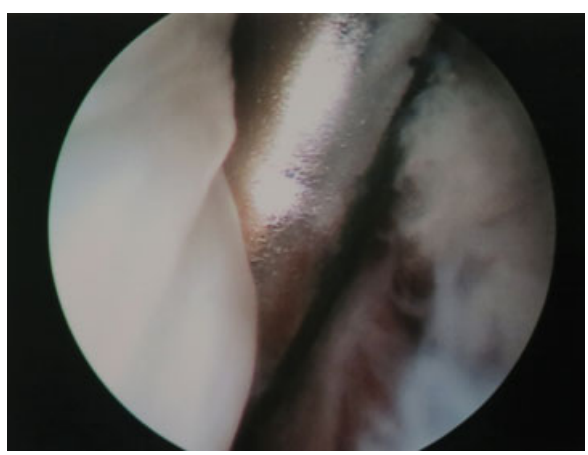

Fig. 8 Arthroscopic photograph showing the dorsal aspect of the lunotriquetral ligament from the 3–4 portal, while the shaver introduced from the 6R portal is being used to shave the junction of the dorsal wrist capsule to the lunotriquetral ligament.

Discussion

Dorsal wrist ganglia can occur at atypical locations such as on the ulnar side,[2] but they were thought to arise, with long

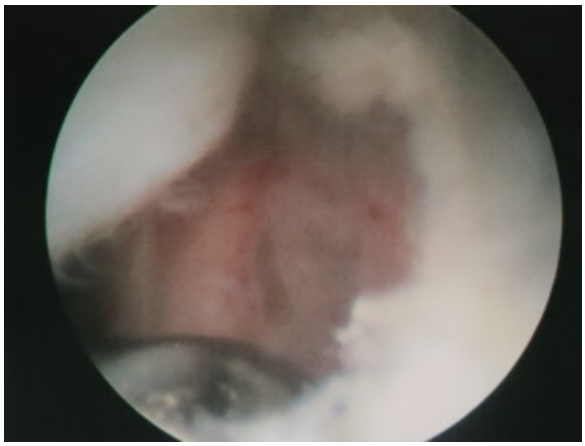

Fig. 9 Arthroscopic picture showing the capsular defect created and the intact remaining lunotriquetral ligament.

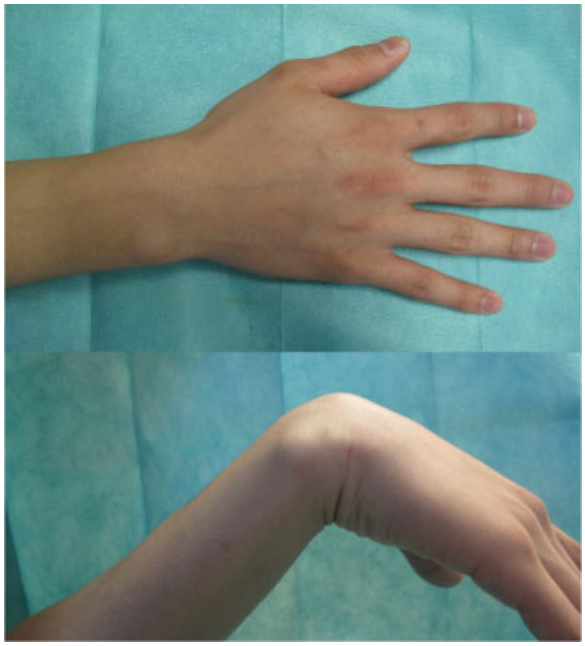

Fig. 10 Photograph of case 2 at 3 years after operation.

pedicles, from the scapholunate junction. This is the first report on the diagnosis and treatment of ganglia arising from the LT joint. The wrist arthrogram in the first case demonstrated contrast going through the stalk of the ganglion opposite the LT junction. Wrist arthroscopy in both cases demonstrated bulging with external pressure at the capsuloligamentous junction of the LT interval, although a stalk was not visualized. In the same manner as the ganglion arising from the scapholunate joint, these lunotriquetral ganglia may well have a one-way valve mechanism that connects with the intercarpal joint, explaining why a resection of this ligament-capsule junction resulted in a successful, recurrence-free treatment. Arthroscopic resections of ganglia have been conventionally applied to ganglia arising from the scapholunate junction and on the dorsoradial side of the wrist, and it has been recommended that atypical ganglia be treated with open excision.[4] There is a risk of rupture of the extensor digiti minimi (EDM) tendon during the shaving of the capsulo-ligamentous junction of the LT interval, which is just opposite to the 4–5 portal area in proximity to the EDM tendon. This could be checked throughout the procedure by asking the patient to extend the little finger, which is an advantage of such a procedure under local anesthesia. Portal site local anesthesia has been established as an effective and safe mode of anesthesia.[14] Wrist arthroscopy has been successfully applied to dorsal lunotriquetral ganglia, and it results in a more cosmetic scar in addition to enabling detection of intercarpal or TFCC pathology.

Conflict of Interest
None

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